REMARKS

Claims 1-3 and 7-19 are pending in the present application. Claims 17-19 are withdrawn.

Claims 1-3 and 7-16 are rejected. Claims 1-3 and 16 are amended and new claims 20-23 are

added herein.

Claim Rejections under 35 U.S.C. §102(b)

Claims 1-3 and 7-16 are rejected under 35 U.S.C. §102(b) as being anticipated by

Fukushima et al. (U.S. Patent No. 5,986,301).

Applicants respectfully disagree with the rejection, and submit that the Examiner has

mischaracterized the relationship between the claimed invention and the cited reference.

In the present invention, the reason why the intermediate layer is formed between the

electrode and the ferroelectric film is the use of inexpensive base metal film as the electrode.

The base metal film is a film which is not self-aligned easily. Therefore, in a case that the

ferroelectric film is formed directly on the electrode, crystal directions of the ferroelectric film

are not aligned easily. Accordingly, in the case that the ferroelectric film is formed directly on

the electrode of the base metal film, it is difficult to form the ferroelectric film having good

perovskite crystal structure. Furthermore, oxygen etc. in the ferroelectric film tends to be

diffused in the electrode of the base metal film. In the present invention, since the intermediate

layer of perovskite crystal structure is formed between the electrode and ferroelectric film, it is

possible to form the ferroelectric film having good perovskite crystal structure, even in the case

that base metal film is used as the electrode.

Page 8 of 12

Applicants note the Examiner's statement on page 2, line 11 of the office communication

that the bottom electrode 242 of Fukushima et al. corresponds to the first electrode of the present

invention. Applicants respectfully disagree with this conclusion.

Applicants note that in the present invention, the first electrode 32 is an electrode of a

base metal. As confirmed in the specification on page 11, lines 20-23, "base metal" is a term

opposed to noble metal, and means metals that are not chemically stable, tend to be oxidized by

heating in air and have high ionization tendency, such as Ni, Cu or Cr.

On the other hand, in Fukushima et al., the bottom electrode 242 is made of a conductive

oxide material having a perovskite structure. For reference purposes, Applicants include

herewith an attachment that includes comparison of Figs. A and B.

Therefore, Applicants submit that the bottom electrode 242 of Fukushima et al. does not

correspond to the first electrode 32 of the present invention.

On lines 13-14 of page 2 of the office communication, the Examiner states that the top

electrode 244 of Fukushima et al. corresponds to the second electrode of the present invention.

Applicants respectfully submit that the Examiner's statement is incorrect.

Applicants note that in the present invention, the second electrode 40 is an electrode of a

base metal, as clarified above. Therefore, the top electrode 244 of Fukushima et al. does not

correspond to the second electrode 40 of the present invention.

On lines 15-16 of page 2 of the office communication, the Examiner states that

Fukushima et al. teaches an intermediate layer of perovskite crystal structure formed at the

boundary between the first electrode, the ferroelectric film and the second electrode, as noted in

the abstract, lines 1-5. Applicants respectfully submit that the Examiner's statement is incorrect.

Page 9 of 12

Applicants note that in lines 1-5 of the abstract of Fukushima et al., Fukushima et al.

describes only the bottom electrode 242, the dielectric film 243 and the top electrode 244 (see

Fig. B in the attached paper).

Applicants submit that Fukushima et al. neither teaches nor suggests an intermediate

layer that corresponds to the intermediate layer 34, 38 of the present invention, as shown in Fig.

A in the attached paper.

In "Response to Arguments" of the office communication, the Examiner states that

Fukushima et al. describes the perovskite material containing Ti on Col. 7, lines 15-25.

However, Applicants note that the perovskite material containing Ti of Fukushima et al.

is a ferroelectric film 243 of Ba_xSr_{1-x}TiO₃ (BSTO). The ferroelectric film 243 of the Fukushima

et al. does not correspond to the intermediate layer 34, 38 of the present invention, as indicated in

Figs. A and B in the attached paper.

On lines 3-5 of page 3 of the office communication, the Examiner states that Fukushima

et al. teaches that the metal is Ni (col. 17, lines 35-45). Applicants respectfully submit that the

Examiner's statement is incorrect.

On lines 35-45 of Column 17 of Fukushima et al, Ni is applied as a material of a bottom

electrode 242, 244 of PrNiO₃ and the top electrode 244 of PrNiO₃. The electrode 242, 244 of

PrNiO₃ is not an electrode of a base metal. Therefore, the electrodes 242, 244 of Fukushima et al.

do not correspond to the electrodes 32, 40 of the present invention.

Fukushima et al. discloses only a device comprising a bottom electrode 242 of conductive

oxide material having a perovskite structure, a ferroelectric film 243 formed on a bottom

electrode 242, and a top electrode 244 of conductive oxide material having a perovskite structure

formed on the ferroelectric film 243.

Page 10 of 12

In the present invention, the reason why the intermediate layer is formed between the

electrode and the ferroelectric film is the use of inexpensive base metal film as the electrode.

The base metal film is a film which is not self-aligned easily. Therefore, in a case that the

ferroelectric film is formed directly on the electrode, crystal directions of the ferroelectric film

are not aligned easily. Accordingly, in the case that the ferroelectric film is formed directly on

the electrode of the base metal film, it is difficult to form the ferroelectric film having good

perovskite crystal structure. Furthermore, oxygen etc. in the ferroelectric film tends to be

diffused in the electrode of the base metal film. In the present invention, since the intermediate

layer of perovskite crystal structure is formed between the electrode and ferroelectric film, it is

possible to form the ferroelectric film having good perovskite crystal structure, even in the case

that base metal film is used as the electrode. Applicants submit that Fukushima et al. neither

teaches nor suggests such feature of the present invention.

In view of the aforementioned amendments and accompanying remarks, Applicants

submit that that the claims, as herein amended, are in condition for allowance. Applicants

request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the

Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to

expedite the disposition of this case.

Page 11 of 12

Response under 37 C.F.R. §1.111 Attorney Docket No. 011267 Serial No. 09/960,296

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP

Kenneth Salen Attorney for Applicants Registration No. 43,077

KHS /led 1250 Connecticut Avenue, NW Suite 700 Washington, D.C. 20036 (202) 822-1100

Attachment: Figs. A and B Comparing Present Invention with that of Fukushima et al. Q:\2001\011267\011267 Amendment 8-20-04.doc